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ABSTRACT

In response to a Congressional request, the General Accounting Office examined issues related to pesticide safety for children in agricultural settings. Pesticides can cause acute, chronic, or delayed-onset illnesses. Children may be exposed to pesticides through farm work; eating pesticide-treated foods; or contact with drift from pesticide applications or with treated plants or soils. Children are more vulnerable to pesticides than adults. In 1998, an estimated 129,000 youth aged 14-17 worked on crops. However, this number may be an underestimate; younger children who are employed illegally are not reported, and parents may bring young children to the fields because child care is unavailable. The Food Quality Protection Act directs the Environmental Protection Agency (EPA) to reevaluate the amount of pesticide residues allowed on or in food and to consider "major identifiable subgroups of consumers" (such as farm children). Comprehensive information on the acute and chronic health effects of pesticide exposure does not exist for farmworkers, farm children, or the general population. The EPA has implemented the Worker Protection Standard, intended to reduce farmworkers' exposure to pesticides. These protections were designed for persons over age 12. Furthermore, the EPA has been inconsistent in monitoring the protections and has little assurance that they are actually being provided to adult or child farmworkers. Recommendations pertain to improving data on acute pesticide illnesses, protecting children under age 12 who are in the fields, evaluating the adequacy of the protections for teenagers working in agriculture, and strengthening EPA oversight of state implementation of the Worker Protection Standard. Appendixes include scope and methodology and EPA comments. (SV)

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United States General Accounting Office

GAO

Report to Congressional Requesters

March 2000

PESTICIDES

Improvements Needed to Ensure the Safety of Farmworkers and Their Children

ED 439 899

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Abbreviations

CDC	Centers for Disease Control and Prevention
EPA	Environmental Protection Agency
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
NIOSH	National Institute for Occupational Safety and Health

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United States General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-284152

March 14, 2000

The Honorable Henry A. Waxman
Ranking Minority Member
Committee on Government Reform
House of Representatives

The Honorable Tom Lantos
The Honorable Bernard Sanders
House of Representatives

Pesticides are designed to kill or control living organisms such as unwanted species of plants, insects, and animals. Because pesticides are designed to be toxic, they have the potential to cause adverse effects on humans. Children are at greater risk from pesticide exposure than most adults because, pound for pound of body weight, children breathe more and eat more. They also have more hand-to-mouth contact than adults. The Environmental Protection Agency (EPA) is responsible for ensuring that when properly used, pesticides do not pose an unreasonable risk to human health or the environment. In this regard, EPA has developed a Worker Protection Standard that is intended to reduce the risks to agricultural workers from pesticide exposure and the possible adverse health effects of pesticides because these workers are among the primary populations exposed to pesticides.

Concerned about the possible adverse effects of pesticides, you asked us to report on issues related to the safety of children who may be exposed to pesticides in agricultural settings. As agreed with your offices, we have addressed a series of questions pertaining to this overall topic and have consolidated these questions into three overall issues: (1) What federal requirements govern the safe use of pesticides, particularly as they relate to protecting children in agricultural settings? (2) What information is available on the acute and chronic effects of agricultural pesticide exposure, particularly on children? (3) What has EPA done to ensure that its Worker Protection Standard considers the needs of children and is being adequately implemented and enforced?

Results in Brief

Two laws principally govern the safe use of pesticides: (1) the Federal Insecticide, Fungicide, and Rodenticide Act, which, among other things, requires that pesticides be approved by EPA for specified uses, and (2) the Federal Food, Drug, and Cosmetic Act, which regulates the residues of pesticides on or in foods. In 1996, the Food Quality Protection Act amended these two laws and required EPA to, among other things, reevaluate the amount of pesticide residues allowed on or in food, taking into account consumers' aggregate exposure from other sources, including residential exposures. Unless another safety factor is determined to be appropriate, EPA is generally required to apply an additional margin of safety in setting limits on pesticide residues to ensure the safety of food for infants and children. This law also directed EPA to consider available information concerning "major identifiable subgroups of consumers" in reevaluating the amount of pesticide residues that can remain on or in foods. In October 1998, the Natural Resources Defense Council and others petitioned EPA to identify children living on and near farms as a major identifiable subgroup for the purposes of the Food Quality Protection Act. In its initial response to the Council, EPA said it was funding several studies aimed at assessing the effects of farm children's exposure to pesticides. As of November 1999, EPA was still considering the Council's petition.

Comprehensive information on the occurrence of acute and chronic health effects due to pesticide exposure does not exist—whether for farmworkers, farm children, or the population in general. The data sources that are available to track acute (short-term) pesticide illnesses are incomplete and have limitations that result in the underestimation of both the frequency and the severity of such illnesses. In 1993, we reported that without a means of monitoring pesticide illnesses, there was no way to determine whether risk assessment or management practices were effective in preventing hazardous exposure incidents. Our current work shows that this problem remains largely unaddressed. Information on the chronic (long-term) effects of agricultural pesticide exposure generally, and for farm children in particular, is also limited. According to the National Center for Environmental Health of the Centers for Disease Control and Prevention, the studies that have been conducted to date have been limited, inconsistent, and inconclusive. A number of federally sponsored studies are under way related to the chronic effects of pesticide exposure, but because of the complexity of the issues involved, it will be many years, and perhaps decades, before conclusive results from these studies are known.

Recognizing the potential for pesticides to cause a variety of illnesses, EPA has implemented the Worker Protection Standard, which is intended to reduce farmworkers' exposure to pesticides. According to EPA, one of the most important protections afforded by the Standard is the time intervals between when pesticides are applied and when workers may enter treated areas (called entry intervals). However, EPA officials told us that these entry intervals were designed for adults and children at least 12 years old who do farm work, but were not designed for children younger than 12 years of age. Furthermore, EPA has little assurance that the protections called for in the Standard are actually being provided to farmworkers generally or to children who work in agriculture. We found that EPA regions have been inconsistent in whether they set goals for the number of worker protection inspections states should conduct, in defining what constitutes a worker protection inspection, and in the extent to which they oversee and monitor the states' implementation and enforcement of the Standard.

We are making a number of recommendations pertaining to (1) improving the data on acute pesticide illnesses, (2) taking steps to protect children younger than 12 years old who work in agriculture or are otherwise present in pesticide-treated fields, (3) completing the documentation on the adequacy of the Standard's entry intervals for children 12 years of age or older who work in agriculture, and (4) strengthening EPA's oversight of the states' implementation and enforcement of the Standard.

Background

Although pesticides play a significant role in increasing food production by reducing the number of crop-destroying pests, exposure to pesticides can be harmful to humans. The ill effects may follow from short- or long-term exposure through skin contact, inhalation, or ingestion. Acute symptoms range from relatively mild headaches to fatigue, nausea, skin rashes, eye irritation, burns, paralysis, and even death. Chronic illnesses and those with delayed onsets, such as cancer, which may only appear years after exposure to pesticides, can also occur. Some chronic illnesses linked to pesticide exposure may be subtle—such as neurological disorders or reduced cognitive skills.

EPA has reported that of the 1.2 billion pounds of pesticides used in the United States annually, 76 percent, or about 950 million pounds, is used in the agriculture industry. According to EPA, farmworkers are among the primary populations exposed to these pesticides. Children may be exposed to pesticides by doing farm work, by eating fruits and vegetables directly

from the fields, by being caught in the drift from field applications of pesticides, or by direct contact with treated plants and soil. Children are more vulnerable than adults are to the effects of pesticides. For example, some pesticides pose a greater risk to infants and children because they breathe more and eat more than adults per unit of body weight, and their bodies and internal organs are still developing, which makes them much more susceptible to the effects of pesticides.

The Department of Labor estimates that there are about 2.5 million hired farmworkers and that about 1.8 million of them work on crops. The number of children who work in agriculture is not reliably known. In 1998, we reported that recent estimates from the Department of Labor's National Agricultural Workers Survey (the Survey) indicated that about 129,000 14- to 17-year-olds were being hired to work on crops in the United States, although this number may be an underestimate.[1] The Department did not survey workers under 14 years of age, but the Survey does contain limited information on children of farmworkers from interviews conducted with their parents. For example, the Survey indicated that, in 1996 and 1997, 7 percent of farmworkers with children 5 years of age or younger took their children with them, at least sometimes, when they worked in the fields. In this connection, on the basis of thousands of inspections of agricultural establishments, the Department of Labor's Wage and Hour Division reported in 1999 that "farmworker children [are] forced to suffer long hours in the fields with both parents working and [virtually] no day care alternatives."

[1]We reported that information collected by the Bureau of the Census indicated that the number of 15- to 17-year-old agricultural workers may be as high as 290,000. This number included workers who work on crops, with livestock, or in services related to agriculture, such as mechanical repairs. These young workers may be hired, self-employed, or unpaid family workers. We also reported that the Fair Labor Standards Act and state laws provide less protection for children working in agriculture than for children working in other industries. For example, children as young as 16 may work in agriculture in any capacity, including in some occupations declared hazardous by the Secretary of Labor, while in nonagricultural industries, children generally may not perform such tasks until age 18. The report also stated that the Congress may wish to reevaluate whether the Fair Labor Standards Act adequately protects children who are hired to work as migrant and seasonal farmworkers. See *Child Labor in Agriculture: Changes Needed to Better Protect Health and Educational Opportunities* (GAO/HEHS-98-193, Aug. 21, 1998).

Federal Requirements Related to Pesticide Protections for Farm Children

The primary federal requirements pertaining to the registration, sale, and use of pesticides are in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug, and Cosmetic Act, both as amended by the Food Quality Protection Act.

Under FIFRA, pesticides must generally be registered with EPA in order to be sold or distributed. EPA will register a pesticide if it determines, among other things, that the pesticide will not generally cause unreasonable adverse effects on human health or the environment when used in accordance with commonly recognized practices. EPA's principal means of ensuring that pesticides are used properly is enforcement of the agency-approved label directions, restrictions, and precautions. Also under FIFRA, EPA established the Worker Protection Standard. States generally carry out the implementation and enforcement of pesticide requirements, including the Standard, under cooperative agreements with EPA.

According to EPA, the Worker Protection Standard is EPA's primary means to reduce farmworkers' risks of exposure to pesticides. EPA established the Standard in 1974, but in 1980, the agency reviewed the Standard and found it inadequate to protect agricultural workers from exposure to pesticides. In 1992, EPA made major revisions to the Standard that the agency began enforcing in January 1995. The revised Standard contains general protections applicable to farmworkers and others, including prohibiting the spraying of pesticides while anyone is in a field or allowing the exposure of people to pesticide spray drift. The Standard also contains provisions that specifically apply to farmworkers, including restricting entry into treated areas for specified periods and requiring employers to provide workers with, among other things, (1) information about when and where pesticides were applied, (2) basic pesticide safety training, and (3) supplies (soap, water, and towels) for workers to use to decontaminate themselves.

According to EPA, the Standard applies to any person who is compensated for activities related to producing agricultural plants, including children who are below the legal age to work in agriculture (generally 12 years of age or older). However, enforcement of the Standard specifically for these young children is problematic because proving that children are working for compensation is difficult when such activity is illegal. For example, EPA told us that it is unlikely that records of any illegal employment are being kept and that neither the farmer nor the worker is likely to be forthcoming about such an arrangement.

The Standard makes employers responsible for providing farmworkers with basic pesticide safety training. EPA regional officials told us that children who work in agriculture receive the same worker protection training as adults. While FIFRA requires those who register pesticides to pay fees to offset EPA's registration costs, none of these fees may be used for pesticide safety training. However, EPA was recently authorized to provide grants for farmworker training (about $200,000 a year). In addition, according to EPA, several EPA regional offices have provided funds to either supplement or develop programs to enhance farmworker training. EPA also provides about $2 million per year to the Department of Agriculture for training pesticide applicators, but none of this funding is used to train farmworkers. During our work, we asked EPA and others about whether there are additional sources of funding or models of funding being provided for the purpose of pesticide safety training. We identified one such model. Specifically, an official of the Iowa State University Extension Service told us that Iowa assesses fees from pesticide dealers that are used to train and certify pesticide applicators.

Under the Federal Food, Drug, and Cosmetic Act, the amount of pesticides that may remain on or in foods is limited to a level (referred to as a tolerance) that EPA has determined to be safe. Under the Food Quality Protection Act, EPA sets tolerances by considering the anticipated dietary exposures to the pesticide and other exposures for which there is reliable information. EPA must consider risks to infants and children and must generally include in tolerances an additional ten-fold safety margin to protect infants and children unless another safety factor is determined to be appropriate. EPA is also required to consider available information on the aggregate exposure levels of major identifiable subgroups of consumers to the pesticide and other related substances, including exposure from dietary and other sources. [2] EPA will not register a pesticide under FIFRA for use on foods unless it has also issued all necessary tolerances for that pesticide.

In October 1998, the Natural Resources Defense Council and other groups petitioned EPA to consider farm children as an identifiable subgroup for the purpose of setting tolerances because they contended that children living on or near farms may have substantially greater exposure to pesticides than other groups of children. The Council also argued that

[2]The Food Quality Protection Act did not specifically define major identifiable subgroups of consumers.

these children represent a significant proportion of the population and should be protected. Several agricultural groups subsequently submitted comments to EPA arguing that the Council had not presented any scientific data showing farm children to be suffering from greater health problems than other populations. The agricultural groups' position is that even if there were problems with farm children being exposed to pesticides from occupational uses, such problems should be addressed under FIFRA. The groups contend that FIFRA was specifically designed to deal with occupational concerns, while the Congress excluded occupational sources from the tolerance-setting done under the Food Quality Protection Act. In December 1998, EPA stated that it was evaluating the issues raised in the Council's petition. EPA is funding several studies aimed at assessing farm children's exposure to pesticides and the effects of this exposure on children's growth and development. However, as of November 1999, EPA had not completed its response to the Council.

As part of its implementation of the Food Quality Protection Act, EPA is revising the way it assesses residential pesticide exposures to better account for farm children's exposures. Among other things, in setting tolerances, EPA will consider pesticides that are tracked into homes and pesticide exposures children receive through spray drift in agricultural areas. As of November 1999, EPA had not completed its revision of methods to assess residential pesticide exposures.

Finally, Executive Order 13045—Protection of Children From Environmental Health Risks and Safety Risks—required each federal agency to identify and assess environmental health risks that may disproportionately affect children. In response to the Order, EPA established the Children's Health Protection Advisory Committee to advise and make recommendations to EPA on issues related to children's environmental health. In 1998, the Committee identified five existing EPA regulations that it believed should be reevaluated to better protect children, including the Worker Protection Standard. The Committee stated that the current Standard had not considered children's exposure to agricultural pesticides, but EPA has not yet responded to the Committee.

Information on the Extent of Acute and Chronic Illnesses From Agricultural Pesticide Exposure Is Limited

The degree to which farmworkers generally, and their children specifically, suffer adverse effects from pesticide exposure compared with the general population is not conclusively known. The data sources that EPA uses to track acute pesticide illnesses have limitations that may result in the significant underestimation of both the frequency and the severity of pesticide illnesses. The National Institute for Occupational Safety and Health (NIOSH) and the National Center for Environmental Health identified a number of steps that could be taken to improve data collection and reporting of acute pesticide illnesses.[3] Information on the chronic effects of agricultural pesticide exposure generally, and for farm children in particular, is also limited. For example, researchers at the National Cancer Institute have reported that farmworkers and their children are frequently exposed to potentially carcinogenic pesticides, but little is known about the occurrence of cancer among farmworkers. The studies that have been conducted to date have been limited, inconsistent, and inconclusive. Nevertheless, the Center for Children's Environmental Health Research at the University of California at Berkeley, recently reported that despite the lack of information on this topic, concerns still exist about the chronic effects of children's exposure to agricultural pesticides.[4] A number of federally sponsored studies are under way on the chronic effects of pesticide exposure, but it will be many years, perhaps decades, before conclusive results from these studies are known.

Information on Acute Pesticide Illnesses Is Not Comprehensive

In 1993, we reported that while some sources of information about acute pesticide illnesses existed, they were generally limited in coverage, comprehensiveness, and quality of information.[5] As a result, there was no capability to determine the precise national incidence or prevalence of pesticide illnesses that occur in the agricultural sector. We concluded that without a valid means of monitoring pesticide illnesses, there was no way to identify problems that may occur with the different uses of pesticides or

[3]NIOSH is a federal agency that conducts research on occupational disease and injury, and the National Center for Environmental Health is a federal agency that conducts research and monitors and evaluates environment-related health problems.

[4]The Center for Children's Environmental Health Research at the University of California at Berkeley has been designated by EPA as a research center for studying the relationship between pesticides and children's health, including growth and development.

[5]*Pesticides on Farms: Limited Capability Exists to Monitor Occupational Illnesses and Injuries* (GAO/PEMD-94-6, Dec. 15, 1993).

to determine whether risk assessment and management practices were effective in preventing hazardous exposure incidents. Six years later, we have found that this problem remains largely unaddressed.

During our current work, officials from EPA told us that no comprehensive national data exist on the extent to which farmworkers (and farm children) are experiencing acute pesticide incidents or illnesses. EPA officials referred us to the National Institutes of Health—specifically, the National Cancer Institute and the National Institute of Environmental Health Sciences—and the Centers for Disease Control and Prevention (CDC)—specifically, the National Center for Environmental Health and NIOSH. Officials from these agencies that collect data on pesticide illnesses confirmed that a lack of comprehensive national data exists not only for farmworkers and farm children, but for the general population as well.

In the absence of comprehensive nationwide information, EPA uses four databases to provide some indication of the extent of acute pesticide incidents and illnesses. These databases are (1) the American Association of Poison Control Centers' Toxic Exposure Surveillance System, (2) the data reported to EPA under FIFRA, (3) the National Pesticide Telecommunications Network, and (4) the California Pesticide Illness Surveillance Program. However, each of these databases has limitations:

- The American Association of Poison Control Centers maintains information on poison exposures. However, its database does not isolate pesticide exposures that occurred from agricultural work (or from any other occupation). In addition, some poison control centers do not report to the national database, and reports that poison control centers receive by telephone may lack medical confirmation.
- Under section 6(a)(2) of FIFRA, registrants are required to submit information they obtain about unreasonable adverse effects of their pesticide products. The 6(a)(2) database was designed to gather information on the effects of pesticides rather than on the extent of pesticide incidents. Therefore, according to EPA, the database contains detailed reports on serious and rare incidents, but little information on less serious incidents.
- The National Pesticide Telecommunications Network (a cooperative effort between EPA and Oregon State University) is a toll-free telephone service that provides the general public and health professionals with information on pesticide health and safety and pesticide incidents. While the Network categorizes pesticide incidents by the age, sex, and occupation of the affected person, the Network's data rely on self-

reporting, and most of the information has not been verified or substantiated by independent investigation, laboratory analysis, or any other means. Moreover, many farmworkers, particularly migrant or seasonal workers, may not have ready access to a telephone to report pesticide incidents.

- The California Pesticide Illness Surveillance Program, often cited as the most comprehensive state reporting system, obtains most of its case reports through the Workers' Compensation system. Therefore, illnesses that occur in farm children who are not officially workers are unlikely to be reported in this system. Also, according to EPA and farmworker advocacy groups, farmworkers may be reluctant to report pesticide exposures because of the potential for retaliatory actions such as loss of job or pay cuts.

Notwithstanding the limitations of California's program, EPA used this information in 1999 to make a nationwide estimate that there were 10,000 to 20,000 incidents of physician-diagnosed pesticide illnesses and injuries per year in farm work. However, EPA recognized that its estimate represents serious underreporting. Moreover, according to officials from the California Department of Pesticide Regulation, because California's crops and pesticide regulations are different from those of other states, it is inappropriate to extrapolate California's data to the rest of the nation. In addition, there are other reasons why acute pesticide incidents are underreported, including farmworkers' hesitancy to seek medical care for financial reasons or for fear of retaliation by employers and physicians' misdiagnosis or failure to report incidents.

Given the limitations of the information on acute pesticide illnesses, we asked officials from CDC what steps are needed to develop a model system for monitoring and reporting acute pesticide illnesses. Two CDC agencies—NIOSH and the National Center for Environmental Health—provided responses.

NIOSH identified a number of steps that could be taken to improve data collection and reporting of acute pesticide illnesses, including the following:

- Establish reporting systems that are based on standardized data elements for pesticide illnesses in all states. Currently, EPA and NIOSH are funding such a program (referred to as the Sentinel Event Notification System for Occupational Risk—or SENSOR—program). The program provides funding and technical assistance to state health

departments to support the pilot testing of standardized data collection on pesticide illnesses and injuries. However, federal funding for this program is limited to five states, and one other state is participating on its own.

- Improve the training of health care professionals to help them recognize acute pesticide illnesses and injuries. In 1998, EPA launched an initiative to provide health care professionals with educational and training opportunities on the health issues pertaining to pesticides. EPA is developing a national plan to fully implement this initiative.
- Conduct a periodic survey of agricultural workers to identify individuals with pesticide illnesses who have not sought health care and therefore have not been reported in surveillance systems. Currently, the Department of Labor's National Agricultural Workers Survey collects limited information on the health effects on the agricultural labor force associated with pesticide exposure. NIOSH indicated that it would like to expand the Survey to include more extensive questions about pesticide exposures and their effects on farmworkers and their family members.
- Improve the collection of data on pesticide use. While some data are available nationally on the quantities of agricultural pesticides used annually, only a few states require the reporting of pesticide use. NIOSH stated that to make the needed calculations of risk and illness rates, it would be useful to have data on pesticide use from all states.

NIOSH stated that implementing these steps would result in better information on the number of illnesses; identify trends in diseases, epidemics, and emerging problems; and provide a means to evaluate the effectiveness of illness prevention and intervention efforts. However, NIOSH estimated that implementing these improvements would cost more than $20 million per year.

The National Center for Environmental Health added suggestions aimed at collecting data on nonoccupational exposures to agricultural pesticides, both for family members of farmers and farmworkers and for the general public. The Center proposed establishing a national reporting system for pesticide incidents that are nonoccupational to complement ongoing occupational reporting. Such a system is currently being piloted in Texas, involving active data collection and case investigations of all pesticide exposures and illnesses in the state that are not associated with work.

Chronic Effects of Pesticide Exposure on Humans Have Not Been Conclusively Researched

Some studies have reported associations between pesticide exposure and a range of chronic effects on humans, including fetal deaths and deformities, cancers, and neurological and developmental effects. However, officials from EPA, CDC (including the National Center for Environmental Health and NIOSH), and the National Institutes of Health (including the National Cancer Institute and the National Institute for Environmental Health Sciences) told us that the chronic effects of agricultural pesticide exposure on humans have not yet been conclusively researched. For example, the National Institutes of Health stated that while pesticide exposure increases the risk of certain tumors, there is scientific disagreement over the specific agents in the pesticide formulation, the specific pesticides within large chemical classes, and the specific doses and timing of exposure that might be responsible. The National Center for Environmental Health told us that "studies of the long-term health effects of pesticide exposures have been inconsistent and inconclusive; therefore, it is not possible to state with any degree of certainty what the long-term effects of pesticide exposure may be."

Even less is known about the combined effects of human exposure to different pesticides. During the course of their work, farmworkers may be exposed to several different types of pesticides. While pesticides may combine their effects in controlling insects (known as a common mechanism of toxicity), it is unknown whether pesticides combine their effects in the same way to cause harm to humans. For example, NIOSH told us that virtually nothing is known about the combined effects of different pesticides on human health.

The chronic effects of pesticides on children have been researched even less than these effects on adults. The National Institutes of Health told us that while links have been identified between some pesticides and leukemia, lymphoma, and brain cancer in children, the results are not conclusive. The research on pesticide-related cancer in children has been limited by the availability of information, such as uncertainty about the levels and types of pesticides involved, and the small numbers of subjects and studies. Similarly, researchers have linked in utero pesticide exposure to defects in fetuses' physical development and to fetal death, but these studies have been limited by methodological constraints similar to those occurring in cancer research.

However, the Center for Children's Environmental Health Research at the University of California at Berkeley (designated by EPA as one of two university research centers for studying pesticides and children's health)

recently reported that notwithstanding the paucity of information about the effects of pesticides on children, "there is substantial evidence in developing rodents and limited evidence in adult humans . . . that low-level chronic exposure to organophosphates may affect neurological functioning, neurodevelopment, and growth."

Federal researchers have several projects under way to begin determining the nature and extent of chronic pesticide exposure on farm children. However, this will be a long and complicated process. The federal research projects under way include the following efforts:

- The Center for Children's Environmental Health Research at the University of Washington is studying the special vulnerabilities of children to health risks from pesticides.
- The Center for Children's Environmental Health Research at the University of California at Berkeley is studying pesticide exposures and their effects on approximately 500 pregnant women and their children in the Salinas Valley area of California.
- The National Cancer Institute, in collaboration with the National Institute for Environmental Health Sciences and EPA, has recently begun the Agricultural Health Study, a large study of pesticide applicators, farmworkers, and their families in Iowa and North Carolina.

These efforts will yield results slowly over a number of years or even decades. Recognizing the potential for pesticides to cause a variety of illnesses, EPA has implemented the Worker Protection Standard intended to help mitigate the possible health effects of pesticide exposure on farmworkers.

The Worker Protection Standard May Not Adequately Protect Young Children, and Questions Exist About Whether the States Are Adequately Implementing the Standard for Farmworkers Generally

One of the most important parts of the Worker Protection Standard—the time intervals between pesticide applications and when workers may enter treated areas (called entry intervals)—was designed to protect adults and children who are 12 years of age or older, but was not designed for children younger than 12 years of age. Nevertheless, there is evidence that young children are either working in agriculture or are present in the fields for other reasons and that they have greater vulnerability to the adverse effects of pesticides than adults. Furthermore, although EPA has stated that implementing the Standard is a high priority, EPA has little assurance that the protections the Standard calls for are actually being provided to farmworkers generally or to children working in agriculture. Under cooperative agreements with EPA, the states monitor and enforce the implementation of the Standard by inspecting agricultural establishments. However, we found that EPA regions have been inconsistent (1) in whether they set goals for the number of worker protection inspections that states should conduct, (2) in defining what constitutes a worker protection inspection, and (3) in the extent to which they oversee and monitor the states' implementation and enforcement of the Standard.

The Worker Protection Standard May Not Adequately Protect All Children Exposed to Agricultural Pesticides

Although young children are present in agricultural fields, either working or accompanying their parents, and are especially vulnerable to the potential adverse effects of pesticides, they may not be adequately protected from pesticide exposure. While the Worker Protection Standard applies to anyone compensated for activities related to producing agricultural plants (regardless of age), according to EPA, the Standard's entry intervals were designed for adults and children at least 12 years old who do farm work, but were not designed for children younger than 12. In 1998, the Children's Health Protection Advisory Committee recommended that EPA expeditiously reevaluate whether the Standard adequately protects children's health. EPA officials told us that the agency had reviewed the process used to establish the entry intervals and, in November 1999, had concluded that the entry intervals protect children 12 years of age or older. However, as of February 2000, EPA had not completed documenting the analysis on which its conclusion is based. Furthermore, EPA officials told us that the agency has not considered whether the intervals protect children younger than 12 because their focus has been on workers of legal age.

Children below 12 years of age, whether working in agriculture or accompanying their parents to the fields, have greater vulnerability to the adverse effects of pesticides:

- Because young children's internal organs and bodily processes are still developing and maturing, their enzymatic, metabolic, and immune systems may provide less natural protection than those of an adult. In 1997, EPA reported that children's tissues absorb chemicals more readily and are less effective at excreting some chemicals from the body. Also, there are critical periods in human development when exposure to toxins can permanently alter the way an individual's biological system operates. In 1993, the National Academy of Sciences reported that children's pesticide exposures are of special concern because "exposure to neurotoxic compounds at levels believed to be safe for adults could result in permanent loss of brain function if it occurred during the prenatal and early childhood period of brain development."
- In addition to breathing more and eating more than adults per unit of body weight, children behave in ways that may make them more susceptible to pesticide poisoning than adults. Because children have greater hand-to-mouth contact compared with adults, oral transfer rates of pesticides from objects, dust, or soil are greater for children. Crawling, sitting, or lying on contaminated surfaces may also increase the exposure rates of children to pesticides.
- Young children may not wear clothing that protects them from exposure as well as adults' clothing. In developing entry intervals, EPA has assumed that workers would be wearing typical farm apparel (i.e., long sleeves, long pants, and work boots). However, this may not always be the attire young children wear when they are in the fields.

While the federal Fair Labor Standards Act generally prohibits children below 12 years of age from working in agriculture, the Department of Labor's Wage and Hour Division has found children as young as 6 years old working in agricultural fields during its inspections (see fig. 1). The Association of Farmworker Opportunity Programs (a public interest group that collects data on farmworkers for the National Cancer Institute) has also reported children as young as 6 years old working in agriculture. Officials from the Department of Labor's Wage and Hour Division told us that they have recently increased their attention to child labor violations in agriculture. However, officials from the Division stated that it will never be possible to uncover all cases of underage children working in agriculture. In addition to underage children who work in agriculture, children accompany their parents to the fields for other reasons, such as the lack of

childcare. These children are not covered by the Fair Labor Standards Act or most provisions of the Worker Protection Standard.

Figure 1: Children as Young as 6 Picking Onions, April 1998

Source: Department of Labor's Wage and Hour Division.

EPA considers the entry intervals it sets to be one of the most important protections in its Worker Protection Standard. When EPA issued the revised Standard (which became effective in January 1995), the agency adopted interim entry intervals until all pesticides could be individually reevaluated. These interim entry intervals were designed to protect against acute reactions to pesticides, but chronic health effects and potential effects on children and fetuses were not considered. In reevaluating the entry intervals, EPA has adopted a new methodology that is more detailed and considers chronic health effects and in utero effects. As of August 1999, EPA had applied the new methodology to 189 pesticides (or groups of related ingredients); EPA estimated that the new methodology may not be

applied to the remaining 192 pesticides (or groups of related ingredients) until 2006.

In developing entry intervals under its new process, EPA determines the amount of time that is required for pesticide residues to dissipate to the level at which it is safe for agricultural tasks to be performed. As part of this process, EPA considers, among other factors, how much exposure workers receive in performing specific agricultural tasks, per unit of body weight. Body weight is a significant factor in calculating entry intervals. All other factors being equal, lower body weight would result in longer entry intervals. For example, EPA generally uses a body weight of 154 pounds when calculating the entry intervals, but if the pesticide has potential fetal developmental effects, EPA uses a body weight of 132 pounds to account for women in their childbearing years. However, EPA told us that the entry intervals protect children who are 12 years of age or older despite their smaller body size (the median weight for 12-year-olds is about 100 pounds) because their bodies have less surface area and they perform less work, resulting in less physical contact with pesticide-treated plants. Finally, EPA officials told us that in setting entry intervals, the agency has not considered whether the intervals protect children younger than 12 years of age because its focus has been on workers of legal age.

Concerned about how well the Worker Protection Standard considers children's exposures to agricultural pesticides, in 1998 the Children's Health Protection Advisory Committee recommended that EPA expeditiously reevaluate the Standard to determine whether it adequately protects children's health. The Committee made this recommendation because it believed that the current Standard did not fully consider the pesticide exposures that children receive through employment in farm work and through other means. EPA agreed to this recommendation, stating that in 1999, it would review its new process for establishing the Standard's entry intervals to affirm that the process adequately factors in the special needs of children employed as farmworkers. In November 1999, as discussed above, EPA officials told us that they had reviewed the available data and concluded that the current process for establishing entry intervals protects children who are 12 years of age and older working in agricultural fields and that this review fulfilled EPA's commitment to the Advisory Committee. However, as of February 2000, EPA had not completed documenting the analysis on which its conclusion was based and therefore had not presented its analysis to the Committee. The Chairman of the Children's Health Protection Advisory Committee told us that the Committee would like to assess how EPA came to the conclusion

that children of legal age are protected under the current process. Moreover, the Chairman stated that the Committee is still significantly concerned about the lack of protection for children below the legal working age.

EPA Has Little Assurance That the Worker Protection Standard Is Being Adequately Implemented and Enforced for Farmworkers Generally

EPA's response to the Children's Health Protection Advisory Committee also stated that EPA believes that the health of children who work in agriculture can be protected by better implementation and enforcement of the Worker Protection Standard. EPA stated that it planned to review the implementation and enforcement of the Standard at the state level to confirm that there is national consistency. As of November 1999, this effort was still in the planning stages. However, we found that EPA's regions have been inconsistent (1) in whether they set goals for the number of worker protection inspections states should conduct, (2) in defining what constitutes a worker protection inspection, and (3) in the extent to which they oversee and monitor the states' implementation and enforcement of the Standard.

The implementation and enforcement of pesticide requirements, including the Worker Protection Standard, are primarily carried out by the states under cooperative agreements with EPA. The agency has developed guidance for the states to use in reporting their pesticide enforcement activities to EPA under the cooperative agreements. Under these agreements in fiscal year 1999, EPA provided the states with about $20 million (or about $400,000 per state, on average) to carry out pesticide enforcement activities, of which $2 million was specifically allocated for worker protection enforcement. EPA's regional offices oversee the states' activities under the agreements. The funds EPA provides cover enforcement activities not only for worker protection but also for pesticide uses in urban settings, among other activities. The ultimate use of these funds among federal pesticide programs is determined by the states in conjunction with EPA's guidance.

In fiscal year 1998, 5 states reported to EPA that they had conducted no routine worker protection inspections, and 11 other states each reported conducting fewer than 10 routine inspections under the cooperative agreements with EPA.[6] In addition to the inspections conducted under the cooperative agreements, states can conduct additional worker protection inspections using state resources. However, EPA regional officials told us that they generally do not receive information on the number of inspections conducted with state resources. Moreover, officials from several EPA regions told us that worker protection enforcement is in its infancy in some states and that the states had conducted few, if any, routine worker protection inspections on their own.

We also found inconsistency among EPA's regions in whether they negotiated goals for the number of routine worker protection inspections that the states should conduct under the cooperative agreements. Specifically, while three of EPA's regions had established goals for the number of routine worker protection inspections that states in their regions should conduct, the remaining seven regions had not. Within the three regions, the goals have established at least a minimum number of routine worker protection inspections to be conducted under the cooperative agreements. For example, beginning in fiscal year 1999, EPA's Atlanta region reached agreement that each of the eight states in the region would conduct between 60 and 100 routine worker protection inspections annually. These goals call for several of the states in the region to do many more inspections than they have done in the past. In fiscal year 1998, Alabama reported that it had conducted only five routine inspections under its cooperative agreement, and Tennessee reported it had conducted four such inspections. The remaining seven EPA regions had not negotiated routine worker protection inspection goals, and according to officials from several regions, it is up to the states to decide how to spend their federal pesticide resources.

Besides the inconsistency in setting inspection goals, EPA was also inconsistent in establishing minimum requirements for what constitutes a worker protection inspection for reporting purposes under the cooperative agreements. Officials from six regions told us that states have varying interpretations of what constitutes a worker protection inspection for

[6]EPA regional officials told us that one of the states that had reported doing no routine worker protection inspections had actually conducted many such inspections but that these inspections were reported under a different inspection category.

reporting purposes. For example, as part of our analysis of the number of worker protection inspections conducted under the cooperative agreements during fiscal year 1998, we noted that Oklahoma had reported conducting 174 such inspections, while New Mexico reported conducting 1 inspection. Officials in EPA's Dallas region told us that the reason for this variation is that some states report having conducted a worker protection inspection if they asked a single question about worker protection during an agricultural use inspection, while other states only report what they consider to be comprehensive worker protection inspections. The Dallas officials attributed this inconsistency to a lack of specificity about what constitutes an inspection for reporting purposes under EPA headquarters' guidance. Officials in four other EPA regions told us that they have addressed this situation by developing regional guidance that for the purposes of the cooperative agreements, calls for worker protection inspections to cover all federal requirements contained in the Standard. Although we obtained and analyzed data on the number of inspections states reported for fiscal years 1996, 1997, and 1998, we are not including this information in this report because of the concerns about the data's reliability for most regions.

We also found that EPA's regions were inconsistent in the extent to which they oversaw and monitored the states' implementation and enforcement of the Standard. During fiscal year 1998, three of EPA's regional offices limited their oversight of the states' worker protection enforcement programs to file reviews, meetings and discussions with state officials, and mid- and end-of-year reports. No one from these regional offices accompanied state officials on any worker protection inspections during the year. For example, the FIFRA Enforcement Coordinator in EPA's Boston region told us that no regional representative had accompanied state inspectors on any inspections and that the regional office was unaware of what states check for when they conduct worker protection inspections. When we inquired about inspection checklists for the states in the region, regional officials said that the region did not have any and that they were unsure whether the states in their region have inspection checklists, although they told us that one state was developing a checklist. In contrast, seven other EPA regions supplemented their file reviews by accompanying state officials on at least some worker protection inspections. Officials from one region told us that joint EPA-state inspections are the best way to observe the adequacy and quality of a state's worker protection enforcement program. Many of the regions said that resource constraints were the primary reason they conduct few, if any, joint inspections.

Finally, EPA's regions had little or no information on the results of the states' worker protection inspections. We found that the regions did not know how many and what types of actions the states had taken in response to worker protection violations. Although the states report to EPA on the number and types of actions (such as fines or warning letters) taken under their pesticide enforcement programs, these statistics do not isolate the number and types of actions that involved worker protection as opposed to other pesticide requirements such as the proper labeling of pesticide products. EPA's Atlanta region, however, has developed a tracking system that is intended to provide the region with statistics on actions states have taken in response to worker protection violations.

Conclusions

Exposure to pesticides can be harmful to humans, and farmworkers are among the primary populations exposed to pesticides. Furthermore, children are more vulnerable to the adverse effects of pesticides because their bodies and internal organs are still developing. The ill effects of pesticide exposure can range from acute symptoms, such as fatigue, nausea, and skin rashes, to chronic effects, such as cancer, neurological disorders, and paralysis. However, there is a paucity of information on the extent of acute and chronic adverse health effects of pesticides on humans. While EPA and others are sponsoring research on the adverse chronic effects of pesticides, it will likely be years, or even decades, before the precise extent and nature of these chronic effects of pesticide exposure on humans are known. Nevertheless, there are shorter-term steps that can be taken to quantify, analyze, and reduce the incidence of pesticide illnesses. These steps would benefit not only farmworkers and their families but the general population as well. Without a valid means of monitoring acute pesticide illnesses, there is no way to determine whether risk assessment and management practices are effective in preventing hazardous exposure incidents. Farmworkers depend on the implementation of EPA's Worker Protection Standard to safeguard them from the adverse effects of pesticide exposure. However, an important part of the Standard—its entry intervals—was not designed for children below 12 years of age, who are more vulnerable to the adverse effects of pesticide exposure; and while EPA has concluded that the Standard's entry intervals adequately protect children who are 12 years of age or older, it has not completed documenting its analysis supporting this conclusion. Finally, EPA has little assurance that the protections called for in the Standard are being adequately implemented for adults or children.

Recommendations

To better understand the overall risks that pesticides pose for farmworkers and their families as well as for the general public, we recommend that EPA work with the National Institute for Occupational Safety and Health and the National Center for Environmental Health to implement their suggestions for improving the quality of information on acute pesticide illnesses in the nation, including establishing time frames, assigning responsibilities, and identifying resource needs and sources to accomplish this important objective.

We also recommend that the Administrator of EPA take the following actions:

- Identify and expeditiously implement steps to mitigate the potential adverse effects of pesticide exposure on children below the age of 12 who work in agriculture or are otherwise present in pesticide-treated fields. Such steps might range from warning farmworker parents about the adverse effects that agricultural pesticides may have on their young children to having pesticide labels clearly state that children should not enter pesticide-treated agricultural areas for specified periods.
- Complete the documentation supporting EPA's conclusion that the Worker Protection Standard's entry intervals adequately protect children 12 years of age and older, and provide the documentation to the Children's Health Protection Advisory Committee for its review.
- Improve EPA's oversight of the states' implementation and enforcement of the Worker Protection Standard by, among other things, (1) clearly defining what constitutes a worker protection inspection for the purposes of the cooperative agreements, (2) establishing goals for the minimum number of worker protection inspections that states should conduct annually under their cooperative agreements, (3) examining whether the resources states dedicate for this function under the cooperative agreements are adequate to achieve the goals established, (4) clarifying the roles and responsibilities of EPA's regional offices to ensure consistency in their oversight of the program, and (5) taking the necessary steps to obtain and analyze data on the results of the states' worker protection inspections, including the number and types of actions taken in response to worker protection violations.

Agency Comments and Our Evaluation

We provided EPA with a draft of this report for its review and comment. EPA provided a written response, which is included as appendix II. In addition, we met with EPA officials including the Director, Health Effects

Division, Office of Pesticide Programs. EPA generally agreed with our findings and recommendations and noted that it appreciated our efforts to understand national, regional, and state perspectives on the issues discussed in the report. With regard to our specific recommendations, EPA had the following comments:

- It strongly welcomes our recommendation to work with the National Institute for Occupational Safety and Health and the National Center for Environmental Health to expand and improve data collection and reporting of pesticide-related illnesses.
- It agrees that it is important to fully assess whether farmworkers' children are currently at risk and to address that risk. However, while EPA's comments identified a number of actions it is taking generally related to this issue, it did not identify specific actions it plans to take directly related to the adequacy of the Worker Protection Standard for children under 12 years of age who work in agriculture or who are otherwise present in pesticide-treated fields. We are concerned that this lack of specificity will allow young children to remain at risk.
- It agrees with our recommendation to complete the documentation supporting its conclusion that the Standard's entry intervals adequately protect children 12 years of age and older. EPA officials told us that they anticipate providing the documentation to the Children's Health Protection Advisory Committee in 2000.
- It believes that our recommendation on the implementation of the Worker Protection Standard is consistent with what EPA has found in looking into the implementation of the Standard. However, EPA did not specifically address how it plans to implement the detailed steps laid out in our recommendation.

EPA also provided technical comments that have been incorporated in the report, as appropriate.

We conducted our review from June 1999 through February 2000 in accordance with generally accepted government auditing standards. See appendix I for our scope and methodology.

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to other congressional committees with jurisdiction over EPA pesticide programs and to the Honorable Carol M. Browner, Administrator, EPA. We will also make copies available to others on request.

If you have any questions about this report, please call me at (202) 512-6111. Key contributors to this report are listed in appendix III.

Peter F. Guerrero

Director, Environmental
Protection Issues

Scope and Methodology

To determine what federal requirements govern the safe use of pesticides, particularly as they relate to protecting children in agricultural settings, we reviewed the Federal Insecticide, Fungicide, and Rodenticide Act and specifically the Environmental Protection Agency's (EPA) Worker Protection Standard. Additionally, we examined the Federal Food, Drug, and Cosmetic Act as amended by the Food Quality Protection Act. In doing so, we reviewed the petition that the Natural Resources Defense Council and other groups submitted to EPA requesting that farm children be designated as a major identifiable subgroup for setting pesticide tolerances for foods. We also reviewed comments from agricultural groups on the petition. Finally, we reviewed EPA's procedures for assessing residential pesticide exposures to determine how EPA is better accounting for farm children's exposure.

To establish what information is available on both the acute and chronic effects of agricultural pesticide exposure, particularly on children, we (1) evaluated data sources that EPA uses to analyze acute illnesses related to pesticides and (2) reviewed current research literature on the chronic effects of pesticide exposure. We also obtained information from leading researchers currently studying pesticide illnesses, including representatives from EPA; the National Cancer Institute and the National Institute for Environmental Health Sciences (both part of the National Institutes of Health); the National Institute for Occupational Safety and Health and the National Center for Environmental Health (both part of the Centers for Disease Control and Prevention); and academic research centers, including the University of Washington and the University of California at Berkeley. We also interviewed officials from several offices at EPA headquarters, most of which were within the Office of Prevention, Pesticides, and Toxic Substances, Office of Pesticide Programs. Because the National Institute for Occupational Safety and Health is the federal agency responsible for conducting research on occupational disease and injury, we obtained its analysis of the strengths and limitations of the current pesticide reporting systems as a whole and with regard to agricultural workers. We also obtained suggestions from the National Center for Environmental Health on improving the reporting of pesticide illnesses and injuries that are not associated with work.

To evaluate the adequacy of the Worker Protection Standard, particularly as it pertains to children, we obtained documents on the issuance and revisions of the Standard. Our documentary review included EPA's response to public comments on the proposed Worker Protection Standard; EPA's National Dialogue on the Worker Protection Standard,

March 1997; a Worker Protection Standard evaluation conducted by EPA's Seattle regional office; a number of states' worker protection inspection checklists; and other guidance material. We also interviewed the Chairman and other representatives of the Children's Health Protection Advisory Committee about its recommendation that EPA evaluate the Standard to determine whether it effectively protects children's health. We met with officials from EPA's Health Effects Division to obtain information on the development and reassessment of the Standard. We reviewed documents on how EPA currently formulates entry intervals to protect farmworkers. Finally, to determine whether children were, in fact, being employed as farmworkers or were present in the fields for other reasons, we analyzed data provided by (1) the Department of Labor's National Agricultural Workers Survey, (2) the Department of Labor's Wage and Hour Division, and (3) a survey conducted by the Association of Farmworker Opportunity Programs for the National Cancer Institute.

To assess the status of worker protection implementation, we interviewed and obtained information from officials in EPA's Office of Enforcement and Compliance Assurance on its guidance to EPA's regions about overseeing the states' worker protection enforcement programs. (For the purposes of this report, "states" include all 50 states, the District of Columbia, U.S. territories, and Native American tribes.) We conducted interviews with the officials responsible for the implementation and oversight of the worker protection program in each of EPA's 10 regional offices. We also obtained data on the number and comprehensiveness of worker protection inspections conducted by the states. We reviewed the quality and consistency of EPA regions' oversight of the states' implementation of the Worker Protection Standard by determining the extent to which regional officials had accompanied state personnel on worker protection inspections and by determining whether EPA's regions had any information on the results of state inspections. Finally, we accompanied representatives from the Virginia Department of Agriculture and Consumer Services on two worker protection field inspections.

We conducted our review from June 1999 through February 2000 in accordance with generally accepted government auditing standards.

Comments From the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Peter F. Guerrero
Issue Area Director, Environmental Protection Issues
Resources, Community, and Economic Development Division
United States General Accounting Office
441 G St. NW
Washington, D.C. 20548

Dear Mr. Guerrero:

Thank you for the opportunity to comment on the draft General Accounting Office's (GAO) report entitled "Pesticides: Improvements Needed to Ensure the Safety of Farmworkers and Their Children." I am responding on behalf of the Office of Pesticide Programs (OPP), and the Office of Compliance and the Office of Regulatory Enforcement in the Office of Enforcement and Compliance Assurance (OECA). The report examines the existing data on pesticide use and exposures to farmworkers, and efforts by the U.S. Environmental Protection Agency (EPA) to assure protection for farmworkers and their children from pesticide risks, particularly through the Worker Protection Standard (WPS). EPA appreciates the efforts of GAO in preparing this document to understand national, regional, and state perspectives on this issue.

Enforcement of the WPS began in 1995. The standard was designed to provide protection of farmworkers, as well as pesticide handlers, from risk from exposure to pesticides. Throughout implementation, EPA has striven to assure that farmworkers are not adversely affected by the use of agricultural pesticides. The WPS also protects all persons from being in the treated area during application and from exposure from pesticide drift. In all of our approaches to pesticide regulatory matters, we are also mindful of the need to pay special attention to potential effects on children. Our focus on children has been further strengthened by specific provisions in the Food Quality Protection Act (FQPA) to consider and apply, where appropriate, additional safety factors for children. While we believe that the Agency has worked very hard to implement a WPS program, with available resources, that provides for an effective regulatory and educational program to protect agricultural workers, we welcome recommendations that might strengthen the existing program as well as other aspects of pesticide regulation, especially as they relate to the protection of children.

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The Agency made a commitment last February to undertake a comprehensive reassessment of the WPS and also to assess whether our current risk assessment methods are protective of children living or working in and around agriculture. This GAO inquiry and report will be very useful in helping us meet our commitment.

I would like to respond to your request for review and comment by EPA by providing "technical" comments as a separate enclosure, while presenting our major reactions to the report in the body of this letter. Included in this response are comments from OPP, OECA, as well as many of the EPA Regional offices. Your report and the recommendations that come out of it focus on three areas. In concept, we agree with your findings and recommendations in all three.

Information on acute and chronic illness. The first area is the state of specific knowledge about adverse effects of pesticides on farmworkers and their children, and what efforts are underway to gather information in this area. As noted in the report, data from and specific to farmworkers and their children is limited, inconsistent, and inconclusive. In assessing risk to these populations, the Agency relies predominantly on data developed using test animals to make judgments about potential effects on humans. These include acute toxic reactions, such as poisoning and skin and eye irritation, as well as long-term effects like cancer, birth defects and reproductive system disorders. Several of the types of studies that are considered are designed specifically to assess risks to infants and children. The Agency assesses toxicity information with data about physical and chemical properties of the pesticide, information on how the pesticide will be applied, and other exposure information to estimate potential risk. Where appropriate, the Agency routinely adds one or more uncertainty factors to ensure an adequate margin of safety. If the Agency determines that it is not possible to assess risk accurately with available data, the Agency will require the pesticide registrant to develop additional data.

Although EPA has a great deal of confidence in the above approach to assessing and addressing risk, it recognizes the value of obtaining "real-life" data collected from human populations that may have significant exposure to pesticides. Consequently, over the last decade, the Agency, in cooperation with numerous state and Federal parties, has expanded its efforts to gather incident, monitoring, and other data associated with actual use of pesticides. We strongly welcome the GAO recommendation that we work with the National Institute for Occupational Safety and Health and the National Center for Environmental Health in expanding and improving data collection and reporting of pesticide-related illnesses. The obvious benefit from evaluating actual human exposure and related illnesses is that it helps us ensure that we are doing our job in protecting everyone, and to take informed action where necessary to mitigate risk.

Addressing risk to farm children. A second area of the report addresses the children of farmworkers that may be subject to risks of concern. These children fall into two groups, those that are working in agriculture and those that are not. The WPS requires employers to provide certain protection to all employees performing activities covered under the WPS. The term, "worker," specifically defined in the WPS, means any person, including a self-employed person, who is employed for any type of compensation and who is performing activities relating to the

production of agricultural plants on an agricultural establishment. However, to take action, the State/EPA has to show that the worker is being compensated and is employed. In some cases, this may be hard to document. For example, it is unlikely that records of any illegal employment are being kept and neither the farmer nor the worker is likely to be forthcoming about the arrangement. Thus, proving certain violations may be difficult.

Until recently, in developing the WPS and conducting risk assessments, our focus has been primarily on workers of a legal age. As mentioned in the report, the Agency's Office of Pesticide Programs recently determined that current risk assessment methods used to establish restricted entry intervals after pesticide application are protective of children at least as young as 12. We believe that younger children may also benefit from implementation of the WPS. For example, efforts to keep adult farmworkers away from sprayed fields help keep children out as well. In addition, the WPS requires that non-workers be protected from pesticide drift.

However, the Agency agrees that it is important to fully assess whether farmworker children are currently at risk and to address that risk. In a generic sense, the Agency, particularly since promulgation of FQPA, has been examining the special vulnerabilities of children, as well as how to estimate exposure to children from typical activities. We have put our findings into use in support of regulatory decisions, such as tolerance reassessment, that are protective of all children. Specific to farmchildren, EPA is also examining whether some of the activities it has already investigated, like playing on a treated lawn, are analogous to exposures farm children may receive. Through these and other activities, we have already begun to address the GAO recommendation to implement steps to mitigate the potential adverse effects of pesticide exposure on the children, whether or not they are covered by the WPS. We will continue to explore opportunities to improve both our risk assessments and effective risk mitigation measures where they are needed.

WPS implementation and enforcement. The last area addressed by the GAO report primarily concerns problems that your investigators found as they looked at how the WPS is being implemented. As noted earlier, we are proud of our efforts to establish as comprehensive a standard as the WPS. These include significant outreach and educational accomplishments and the development of cooperative relationships among a variety of stakeholders, all achieved within a relatively constrained resource base. Nevertheless, we recognize that the initial implementation of the WPS can be improved by assessing the consistency and effectiveness of our outreach, education, compliance and enforcement activities. These include a variety of efforts ranging from review of a number of procedural steps to the major review of WPS that is mentioned in the GAO report. Overall the recommendations are consistent with what the Agency has seen in looking at WPS implementation and EPA will consider the recommendations as part of its program review assessment. The Agency agrees that it needs to improve the information available on WPS inspections/enforcement.

The Agency does appreciate the analysis and recommendations presented by GAO. There is a general consensus among the reviewers that your recommendations are sensible and

we intend to take them seriously as we go through our extensive reassessment of the WPS this year. Again, thank you for the opportunity to comment on this report. Please feel free to contact me if you would like additional information.

Sincerely,

Marcia E. Mulkey, Director
Office of Pesticide Programs

Enclosure

GAO Contact and Staff Acknowledgments

GAO Contact

Chuck Barchok, (202) 512-3548

Acknowledgments

In addition to the individual above, Patricia J. Manthe, Richard A. Frankel, Donald J. Sangirardi, Gopaul E. Noojibail, and Richard P. Johnson made key contributions to this report.

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